THE ECONOMIC IMPACT OF NASA IN FLORIDA 2003



The Launching of "Spirit" & "Opportunity" to Mars

The Chief Financial Officer (CFO) at the Kennedy Space Center (KSC) annually sponsors an economic impact assessment of KSC and other NASA spending in Florida on the local, regional and state levels. This year's study was conducted by the *Transportation Economics Research Institute*, a private organization under the direction of Dr. Warren McHone, Professor of Economics at the University of Central Florida, based on data supplied by KSC and its affiliates.

The Office of the CFO is pleased to submit the results of the 2003 study, covering the fiscal period from October 1, 2002 through September 30, 2003. The report and methodology has been reviewed and we concur with its findings.

Additional copies of the report are available through the Office of the CFO -- (321) 867-3726.

N.A. Carroll
Chief Financial Officer
John F. Kennedy Space Center

THE ECONOMIC IMPACT OF NASA IN FLORIDA—2003

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The Economic Impact of NASA in Florida—2003

TABLE OF CONTENTS

STUDY HIGHLIGHTS	II
KITTY HAWK TO MARS IN ONE HUNDRED YEARS	1
NASA LAUNCH AND SPACE FLIGHT SPENDING IN FLORIDA	2
LAUNCH AND SPACE FLIGHT EMPLOYMENT AT KSC	3
LAUNCH AND SPACE FLIGHT EARNINGS AT KSC	3
LAUNCH AND SPACE FLIGHT NON-LABOR PURCHASES IN FLORIDA	4
VISITOR CENTER AND BUSINESS VISITOR SPENDING	6
TOTAL INJECTIONS INTO FLORIDA ECONOMIES BY KSC AND OTHER NASA CENTERS	7
THE TOTAL ECONOMIC IMPACT OF NASA IN FLORIDA	8
INDIRECT ECONOMIC ACTIVITY GENERATED BY NASA SPENDING	8
THE TOTAL ECONOMIC IMPACT	9
THE IMPACT MULTIPLIERS	10
SUMMARY AND CONCLUSION	11
NOTES	11

The Economic Impact of NASA in Florida— 2003

STUDY HIGHLIGHTS

In FY 2003, KSC and other NASA Centers injected \$1.41 billion into Florida's economy to support launch and space flight operations at Kennedy Space Center (KSC). While this amount was slightly off its FY 2002 level for the state, spending in Brevard County was up by \$60 million over its FY 2002 level.

KSC & Other NASA Centers awarded 474 contracts in Florida in FY 2003. 87% of KSC/NASA spending (including Civil Service wages) was concentrated on-site at KSC.

Total KSC/NASA direct spending was \$1.32 billion in Brevard County, \$15 million in other Central Florida counties and \$78 million in other Florida counties.

The total number of KSC on-site workers in FY 2003 was close to 14 thousand. 86% of the total was employed by prime contractors. 82% of the on-site work force lived in Brevard County and another 17% commuted from other Central Florida counties.

Workers at KSC received a total of \$828 million in spendable earnings in FY 2003. Ninety-nine percent of these earnings went to workers residing in Brevard and other Central Florida counties.

The average annual salary for KSC on-site workers was \$60 thousand in FY 2003, which was almost twice the salary that was earned by the average Brevard County worker.

The Economic Impact of NASA in Florida— 2003

Commodity purchases by KSC and other NASA Centers in Florida totaled \$581 million in FY 2003. Two-thirds of these purchases were concentrated in four industry categories: Professional, Scientific & Technical Services, Space Vehicle Manufacture, Facilities Support Services and Aircraft and Missile Equipment.

In FY 2003 the KSC Visitor Center hosted 878 thousand out-of-state visitors. In addition, out-of-state business visitors to KSC generated 4.3 thousand visitor nights in Central Florida. Taken together these two sources provided a \$23.6 million injection into the State's economy with the overwhelming portion concentrated in Brevard and other Central Florida counties.

In FY 2003 all KSC/NASA activities injected \$1.42 billion of outside money into Florida's economy. This total consisted of \$849 million in direct earnings payments to households and \$580 million in direct commodity purchases from contractors. Ninety-five percent of the total injection went to Central Florida businesses and households.

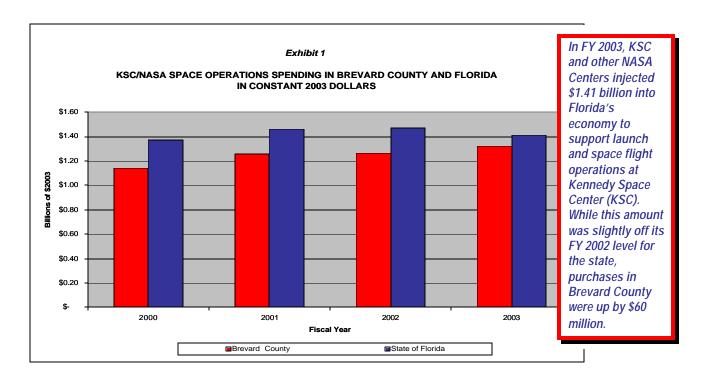
In FY 2003 the total economic impact of NASA in Florida was over \$3 billion in output, \$1.5 billion in household income and 35 thousand jobs. This activity also generated \$188 million of federal taxes and \$66 million of state and local taxes.

75% of the output impact, 73% of the income impact and 72% of the jobs impact occurred in Brevard County.

At the state level each direct job at KSC was multiplied into 2.4 total jobs, each dollar of income was multiplied into \$1.81 in total income and each dollar of total direct spending for commodity purchases and wage payments was multiplied into \$2.18 of output production.

KITTY HAWK TO MARS IN ONE HUNDRED YEARS

One hundred years ago man's quest for powered flight was achieved with a 12 second flight covering 120 feet at Kitty Hawk, N.C. With this breakthrough, the door was opened to a stream of inventions and innovations that have taken us from the white sands of Kitty Hawk N.C. to the red sands of Mars. For the last 45 years of this technological journey, NASA and Kennedy Space Center (KSC) have led the way. KSC has, and will continue to be, the primary gateway to space for the United States. The successes of the men and women that work at the Nation's spaceport are a great source of pride for Floridians, in general, and Central Floridians, in particular. Beyond the pride, NASA and KSC also provide an enormous stimulus to the state and local economy. As shown in Exhibit 1, in FY 2003 KSC and other NASA Centers injected \$1.41 billion into the Florida economy to support launch and space flight operations at KSC. While this amount was slightly below its previous year's level for the State, spending in Brevard County actually increased by \$60 million.



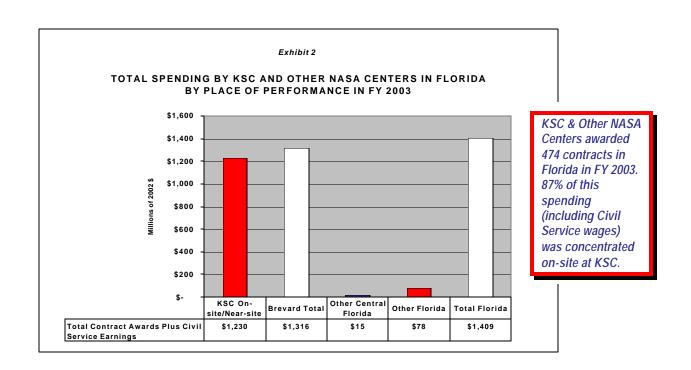
In addition to KSC/NASA's spending on space operations there are a number of other activities directly associated with KSC that add to its total economic impact in Florida. These include the local travel expenditures of out-of-state business and government personnel that travel to KSC to conduct business and the Kennedy Space Center Visitor Center's (KSCVC) sales to out-of-state visitors. The economic impact of all of these activities is presented in this report. The analysis is conducted

at three geographic levels – Brevard County, the larger Central Florida Region, which includes Brevard, Flagler, Lake, Orange, Osceola, Seminole and Volusia counties, and the state as a whole.

NASA LAUNCH AND SPACE FLIGHT SPENDING IN FLORIDA

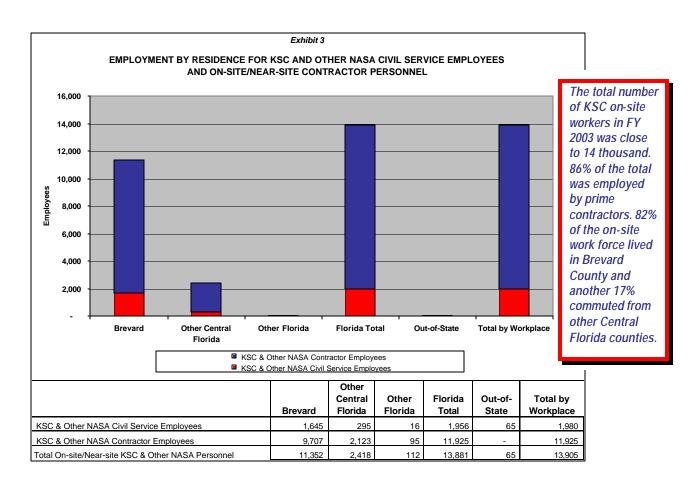
The primary responsibility of KSC in NASA's space program is the launch function. While the manned Space Shuttle program was put on hold in February of 2003 until the safety issues associated with the program are resolved, the Expendable Launch Vehicle program was quite active during FY 2003 with a total of seven launches. To carry out its responsibilities, KSC awarded 238 separate contracts in FY 2003 ranging from a \$1,000 contract to a local industrial machinery supplier to a \$297 million award to the firm that manages all of KSC on-site facilities and operations. The ten largest contracts represented 87% of KSC's total awards. Eight other NASA Centers awarded a total of 236 contracts in Florida in FY 2003. The largest of these awards was the Johnson Space Center's \$429 million contract for space flight and control operations. This one contract represented almost 80% of the total spending in Florida by other NASA Centers.

Eighty-seven percent of KSC/NASA spending was for awards to on-site contractors and wages to on-site Civil Service and contractor workers. In addition to the on-site spending, other Brevard County contractors received 6% of the total awards in Florida. Total direct spending in Brevard County was \$1.32 billion in FY 2003. Direct spending in other Central Florida counties and other counties in Florida totaled \$15 million and \$78 million, respectively.



LAUNCH AND SPACE FLIGHT EMPLOYMENT AT KSC

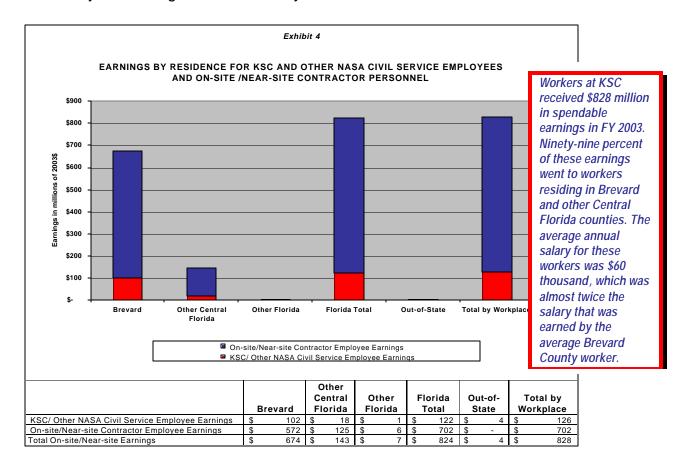
There were close to 14 thousand on-site and near-site workers at KSC in 2003. This includes workers involved in launch and space flight control and those workers involved in planning, maintenance and operation of KSC facilities. The overwhelming majority (86%) of on-site workers was employed by KSC/NASA prime contractors. The remainder was federal civil service workers employed by KSC and other NASA Centers. As might be expected, most of the employees at KSC lived in Brevard County. However, as illustrated in Exhibit 3, over twenty-four hundred workers commuted from nearby Central Florida counties and a small number of workers lived in other Florida counties or resided outside the State.



LAUNCH AND SPACE FLIGHT EARNINGS AT KSC

Contract and civil service workers at KSC received \$828 million dollars in spendable earnings in FY 2003 (see Exhibit 4). Ninety-nine percent of these wages went to residents of Brevard and other Central Florida counties. A large majority of the workers at KSC are highly trained engineers, scientists and technicians that command relatively high salaries. Accordingly the average annual salary for these

workers was \$60 thousand, which is almost twice the \$34 thousand salary that is earned by the average Brevard County worker.

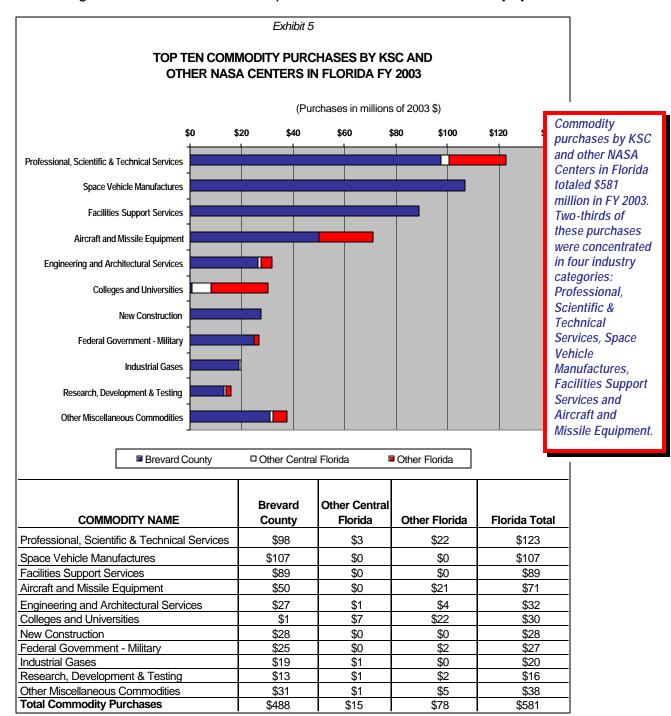


LAUNCH AND SPACE FLIGHT NON-LABOR PURCHASES IN FLORIDA

KSC and other NASA Center's non-labor purchases in Florida totaled \$581 million in FY 2003 and were concentrated in a relatively small number of commodity categories. As revealed in Exhibit 5, the top four commodity categories constituted over two-thirds of the total non-labor purchases that were made by KSC and other NASA Centers in Florida in FY 2003. Ninety-six percent of the total non-labor purchases were concentrated in the top ten commodity purchase categories.

The top commodity category for non-labor purchases in FY 2003 was the \$123 million spent on *Professional, Scientific & Technical Services*. Seventy-two percent of these purchases were for services provided by the KSC base operations contractor and the Johnson Space Center contractor that handles space flight control operations. At \$107 million *Space Vehicle Manufacture* represented the second largest commodity category. All of the purchases in this category were from the contractor that provides the launch vehicles and packages the payloads for Delta Rocket launches. The \$89 million in the *Facilities Support Services* category were for the purchases of materials and other non-labor services required

by the major on-site contractors that plan and manage launch and space flight control operations and KSC facilities management activities. Rounding out the top four categories was the \$72 million spent for *Aircraft and Missile Equipment*.



KSC VISITOR CENTER AND BUSINESS VISITORS

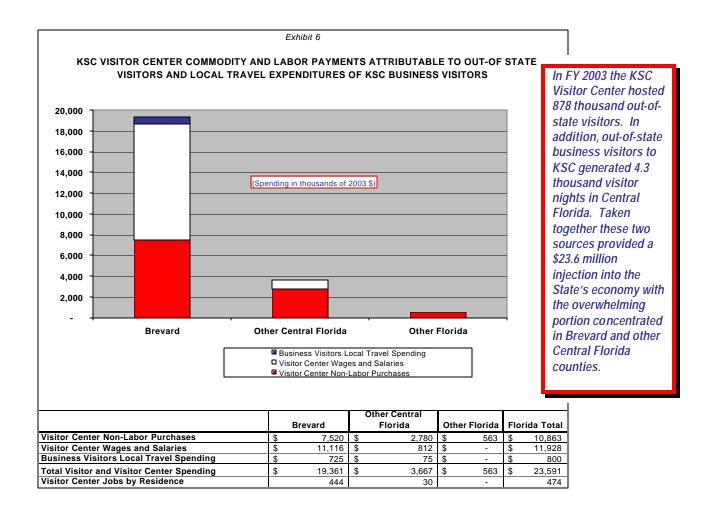
VISITOR CENTER AND BUSINESS VISITOR SPENDING

KSC's economic presence in Florida is not just limited to the contracts and employees that are required to carry out launch and space flight operations. In FY 2003, 878 thousand out-of-state residents visited the KSC's Visitor Center (KSCVC) and spent over \$40 million on goods and services provided by the Visitor Center. The Visitor Center had 764 employees which it paid \$19 million in wages. All of these employees were residents of Central Florida. In addition to its payroll expenses, the Center spent \$29 million to purchase the merchandise and services that are required to operate the facility. However, the only relevant part of these purchases for the impact analysis is the \$17.5 million that were purchased from Florida firms.

In considering the economic impact of Visitor Center expenditures in Florida, it is necessary to focus only on the portion of the purchases that go to Florida firms and residents and the portion of these purchases that are attributable to out-of-state visitors. The logic behind such an adjustment is that the expenditures by in-state visitors do not represent an injection of outside money into the state and local economies. Instead these expenditures are only a transfer of economic activity between sectors within the state or local economy. Based on the geographic distribution of visitors, it was determined that 62% of the total activity at the Visitor Center should be attributed to out-of-state visitors. Consequently, the relevant amounts of KSCVC injections for the impact analysis were \$12 million in salaries and \$10.8 million in other non-labor purchases for a total injection of \$23 million.

One other important source of NASA's economic stimulus in Florida is the local travel expenditures of out-of-state business visitors that came to KSC. This includes visitors that come from NASA Headquarters, other NASA Centers and out-of-state contractor personnel. The purpose of the visits includes pre-launch meetings and reviews, general information exchange and a variety of other business functions. It is estimated that there were over 1,062 such business visitors in FY 2003. These visitors generated 4,326 visitor nights in the Central Florida area. Their total local travel purchases for lodging, food, car rentals and other miscellaneous items was \$800 thousand. All of these expenditures represented an injection of outside money into the local economy. The purchases by the Visitor Center attributed to out-of-state visitors and the local travel expenditures of KSC business visitors' resulted in a total injection of \$23.6 million dollars into the local economy in FY 2003. The details of this injection are show in Exhibit 6.

TOTAL KSC/NASA INJECTIONS INTO THE ECONOMY

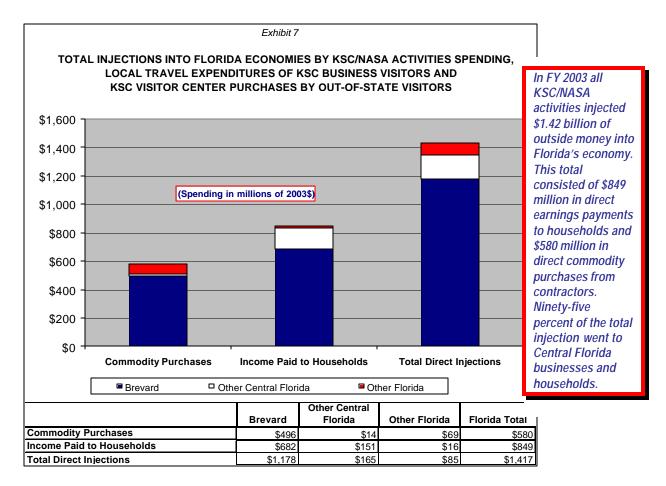


TOTAL INJECTIONS INTO FLORIDA ECONOMIES BY KSC AND OTHER NASA CENTERS

The purchases and household income payments that are described in the preceding sections of this study are injections of outside money into the economies of Brevard County, the larger seven-county Central Florida region and the state as a whole. These injections enter the economy through direct purchases of goods and services from contractors and the direct payment of earnings to workers. For the purpose of this analysis, all on-site contractors' awards were divided into their wage and non-wage components. The wage portion of these contracts was added to the earnings of KSC and NASA Civil Service workers to arrive at the amount of direct household income received by all on-site workers at KSC. Awards to colleges and universities were also divided into wage and non-wage components with the latter being entered into the analysis as direct household income. Exhibit 7 shows the total direct commodity purchases and direct household income payments resulting from spending for space flight operations, KSC Visitor Center Sales to out-of-state visitors and KSC business visitor local travel spending.

TOTAL KSC/NASA INJECTIONS INTO THE ECONOMY

The total injection of outside money into Florida's economy in FY 2003 from all KSC/NASA activities was \$1.42 billion. Direct earnings payments to Florida households totaled \$849 million and direct commodity purchases from contractors were \$580 million. Ninety-five percent of the direct payments went to Central Florida businesses and households.



THE TOTAL ECONOMIC IMPACT OF NASA IN FLORIDA

INDIRECT ECONOMIC ACTIVITY GENERATED BY NASA SPENDING

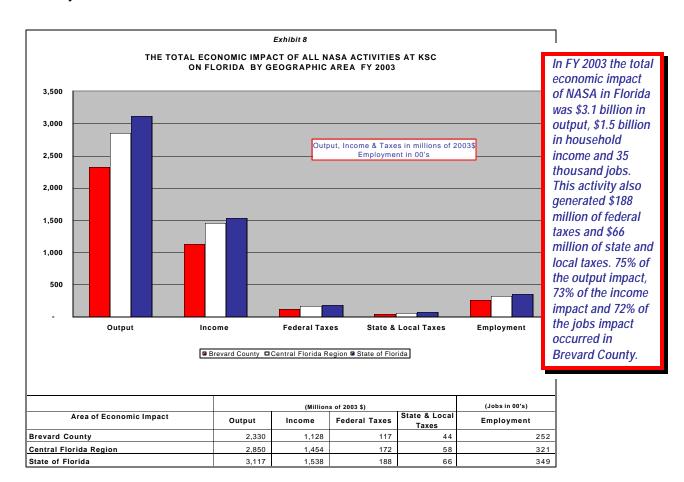
The economic activity generated by NASA organizations in Florida begins, but does not end, with the direct purchases of these organizations and the wage payments to their workers. This first round of spending generates a secondary set of economic interactions in the local businesses that supply goods and services to NASA contractors and employees. These businesses, in turn, pay wages to their employees and buy goods and services from their own suppliers and the process continues through many subsequent rounds of purchases. All of these rounds of indirect activity are referred to as the generated impact of the initial KSC/NASA injections into the economy.

TOTAL ECONOMIC IMPACT OF NASA IN FLORIDA

The tracing and accumulation of all of the many rounds of generated economic activity that are set in motion by NASA's initial stimulus requires a complex set of economic models that map the structure of the economy and the way in which the many sectors of the economy interact to support each other. These models are referred to as regional input-output models. The specific models used in this study utilize a highly detailed breakdown (500 plus economic sectors) of the economy to trace economic transactions. Separate models were built for Brevard County, the larger seven-county Central Florida region and the State of Florida as a whole.

THE TOTAL ECONOMIC IMPACT

The total impact of all KSC/NASA activities in Florida is the sum of the initial injection of earnings and commodity purchases plus the subsequently generated impact of these injections. In FY 2003, this total impact in Florida was \$3.1 billion in output; \$1.5 billion of household income and 35 thousand jobs (see notes at end of study for description of changes in impact method calculations). This activity also generated \$188 million of federal taxes and \$66 million of state and local taxes. As might be anticipated the largest share of the impact—75% of the output impact, 73% of the income impact and 72% of the employment impact—occurred in Brevard County.

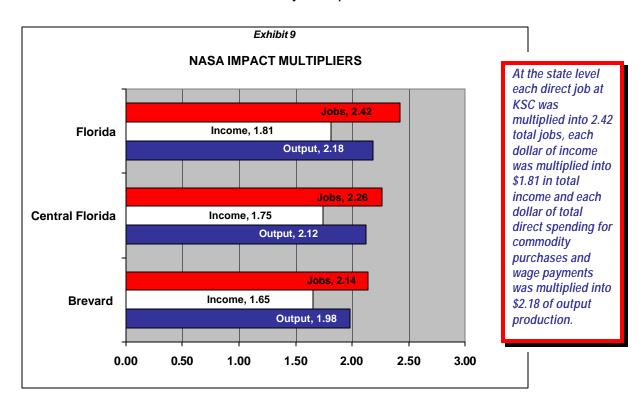


TOTAL ECONOMIC IMPACT OF NASA IN FLORIDA

THE IMPACT MULTIPLIERS

Impact multipliers provide a summary measure of the economic potency of a particular economic activity. Multipliers were calculated in this study for Output, Income and Employment. The Output Multiplier is the total output impact as shown in Exhibit 8 above divided by the total direct spending for commodity purchases and wage payments to workers. The Income Multiplier is the total income impact shown in Exhibit 8 divided by the initial direct wage payments to KSC/NASA Civil Service and on-site contractor employees. Finally, the employment multiplier is the total employment impact shown in Exhibit 8 divided by the number of on-site employees at KSC.

The multipliers that were calculated for each of the geographic study areas in this analysis are shown in Exhibit 9. The jobs multipliers for the State as a whole indicates that each direct on-site job (i.e. Civil Service and contractor employees) at KSC and the Visitor Center was multiplied into 2.42 total jobs throughout the Florida economy. It should be noted that this represents the direct job itself plus 1.42 jobs that were generated through the indirect generated economic process. The Florida income multiplier indicates that each dollar of direct wages that was paid at the KSC complex resulted in \$1.81 of total income in the State. The output multiplier shows that each dollar of direct total spending for commodity purchases and wage payments generated \$2.18 in total statewide output. Similar interpretations apply to the Central Florida and Brevard County multipliers.



SUMMARY AND CONCLUSION

SUMMARY AND CONCLUSION

While the total amount of dollars that KSC and other NASA Centers injected into the overall Florida economy in FY 2003 was down slightly from the previous year's level, it still represented an enormous boost for the state economy. contrast, KSC/NASA direct spending in Brevard County was actually up by 5% over its FY 2002 level. While fluctuations in KSC/NASA spending are to be expected from year to year, the total economic impact of NASA in Florida is unmatched by any other single economic entity in the State. The large number of highly paid employees and the high dollar contracts that are awarded within the State create both a direct effect for state businesses and residents and a strong indirect impact on businesses and households that are not directly associated with the "space industry." In FY 2003 KSC and other NASA space operations and associated activities created a total economic impact for the State of \$3.1 billion in output, \$1.5 billion in income and 35 thousand jobs. The total economic impact was highly concentrated in Brevard County with an output impact of \$2.3 billion, an income impact of \$1.1 billion and an employment impact of 25 thousand workers. numbers should leave little doubt that NASA continues to represent one of the most important economic engines in Florida's economic base.

NOTES

Change in Output Impact Calculation Method: The method used to calculate the total output impact in FY 2003 differs from that used in earlier KSC/NASA economic impact studies. Specifically, the total initial spending used to calculate the total output impact includes both commodity purchases and payments to households, whereas earlier studies only included commodity purchases in their initial spending total. It is felt that the new method provides a more accurate depiction of the output impact and multiplier. For purposes of comparison, a recalculation of the FY 2002 Output Impact using the new method equals \$3,069 million for Florida, \$2,693 million for Central Florida and \$2,359 million for Brevard County.

Impact Models: The economic impact analysis presented in this report is generated by a set of regional input-output models constructed by the *Transportation Economics Research Institute* using the Minnesota IMPLAN Groups (MIG) software package. Structural data for the models was also provided by MIG.

Study Areas: Input-output models were constructed for three geographic areas—Brevard County, Central Florida (which includes Brevard, Flagler, Lake, Orange, Osceola, Seminole and Volusia Counties) and the State of Florida.

Data Sources: All data and numbers reported and used in this study are based on reports and data files provided through the Office of KSC's Chief Financial Officer or found on the KSC internet site. Numbers reported in the impact section of the report were generated by the economic impact models constructed for this study.

Methodology and Study Details: The methods of analysis, report assumptions and detailed tables of results are available upon request

This report has been produced exclusively for the National Aeronautics and Space Administration, John F. Kennedy Space

Center, Office of the Chief Financial Officer

March 2004

